

This new species certainly differs from *B. spinosa*, Simon, the type, and hitherto the only known representative of the genus, at least in having the legs strongly rufescent. *B. spinosa* (Ann. Soc. Ent. France, 1880, p. 400) was obtained near Alexandria. It must be added that Simon gives as a character for his genus the fact that the tarsi of the fourth leg are bisegmented. I cannot, however, distinguish two joints on these tarsi in my specimen.

XXVI.—*Contributions from the New Mexico Biological Station*.—No. II. (continued). *On a Collection of Diptera from the Lowlands of the Rio Nautla, in the State of Vera Cruz*. II. By C. H. TYLER TOWNSEND, F.E.S.

[Continued from p. 33.]

TRICHOPODA.

At least eight species of *Trichopoda* were secured by me, one of which has already been described in Section I. (*T. tegulata*, Towns., No. 15). In separating these forms, it was discovered that the males, especially in the smaller species, frequently have the tips of the foot-claws broken off, some specimens not having a single claw-tip remaining. But they are always broken evenly and at a uniform length, so that the specimens present the appearance of being a distinct form with peculiar claws. Such is, of course, not the case. An examination shows that the male claws become abruptly more slender just before the black hook-like tips, and it is at this point that they break, leaving a straight yellow claw perfectly blunt at the tip. These injuries are perhaps received in pairing.

It should be mentioned that in most *Trichopodas* the female claws are quite evenly curved and not greatly elongate, with a hook-like curve at extreme tip, and yellow with tips rather widely black. In the male the claws are elongated, almost straight, less conspicuously black at tips, which are abruptly bent hook-like at extreme ends. The leverage of the claws on the bent tips causes the fracture of the latter. *T. phasiana*, sp. n., is a notable exception in colour of claws, which are black, while the form of the claws is the same as above described. In *T. histrio*, on the other hand, the claws are not so elongate, yet nearly straight, while their coloration agrees with that of the other species of the genus.

The yellow colouring of the wings, which I had previously considered to be a distinctive sexual character in the male, I

find to vary greatly, being nearly or quite obsolete in some males. The supposed characteristic black on tip of the female abdomen is often subobsolete or wholly wanting.

Size is another character that cannot be relied upon in this group, which seems to approach the nearly allied family Conopidæ in this respect. In some species of *Zodion*, for example, the disparity in size is sometimes very great. I have two specimens of the same sex (male) of *Z. splendens*, one of which is at least five times as large, bulk for bulk, as the other, and yet does not differ appreciably otherwise (see forthcoming papers on Diptera of the Organ Mountains and Diptera of the Mesilla Valley, N.M.).

The scutellum is often subtranslucent, more or less pollinose, so as to appear nearly concolorous with the yellow or reddish abdomen in species with such colours prevailing, rather than with the thorax. This character cannot be trusted, as it is changeable in the same specimen, according to age, degree of preservation, &c. Moreover, there are all gradations in specimens in this respect, so that no separation can be made.

The form of the abdomen is not always constant as a sexual character. Females of the smaller forms often approach the male in the wider subflattened abdomen, while some males even boast the subcylindric abdomen of the female. In all cases of doubt as to sex, the only criterion to be depended upon lies in the sexual organs themselves.

The forms of *Trichopoda* exhibit such a range in size, coloration of wings, abdomen, &c., that it is likely that many of the older names will have to be classed as synonyms, or continued only to mark varieties. The above remarks on colour variation apply more particularly to the smaller forms, *pennipes* and var. *pilipes*.

The following table of species and varieties of *Trichopoda* includes only the forms, and sexes of those forms, known to me from examination :—

Table of Species of Trichopoda.

Males.

- | | |
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| 1. Wings with only a narrow internal border, hyaline | 5. |
| Wings with at most the costal half coloured, the inner half or more clear..... | 2. |
| 2. Abdomen black, with a large pale yellow spot on each side at base | <i>phasiuna</i> , sp. n. |
| Abdomen brown or black, without such spots, golden pollinose on apical segments. | 3. |

3. Costal half of wings fuscous, without yellow; pollen of abdomen divided by a median stripe 4.
 Nearly all of costal half taken up with yellow, leaving but little fuscous; no median abdominal stripe dividing the pollen *histrio*,
 var. *indivisa*, var. n.
4. Segments four and five each with an interrupted golden-yellow pollinose fascia, third segment without *histrio*, Walk.
 Typical form.
- Segments three, four, and five, and sometimes also the anal, with such fascia ... *histrio*,
 var. *trifasciata*, Lw.
5. Wings with yellow or milky-white; if with no white, at least with a distinct trace of yellow near costa 6.
 Wings wholly black except inner border, without yellow; abdomen mostly reddish yellow, sometimes dark at tip; mesoscutum with postsutural golden markings. *pennipes*,
 var. *pilipes*, Fabr.
6. Wings milky-radiate on a yellow or fuscous background (*formosa* and vars.) 8.
 Wings not so 7.
7. Wings with a more or less distinct yellow patch on costal portion, never approaching tip of wing; abdomen reddish yellow, with no blackish unless at tip *pennipes*, Fabr.
 Typical form.
- Wings yellow on costal portion, nearly approaching tip, the yellow bordered behind by fuscous, which takes up the middle of the wing lengthwise; abdomen yellow with black on base, continued posteriorly in a median stripe *subalipes*, Towns.
8. Mesoscutum with postsutural golden-pollinose markings 9.
 Mesoscutum without such markings 10.
9. Milky radiations of wings very conspicuous with the yellow less apparent, abdomen rather strongly purplish; hind femora strongly ciliate on apical half: robust form *formosa*,
 var. *radiata*, Lw.
- Wings conspicuously and broadly yellow, with the milky radiations less apparent; abdomen orange-yellow, more or less dark on median line and tip *formosa*,
 var. *inconstans*, Wd.
10. Wings with the milky radiations on a fuscous ground, with little if any yellow; hind femora ciliate apically, abdomen reddish shading to purplish *formosa*, Wd.
 Typical form.
- Wings with a yellow patch, hind femora

- not ciliate; abdomen orange-yellow or orange, never inclining to purplish. 11.
 11. Bases of femora broadly reddish yellow; wings only lightly milky-radiate with a yellow patch near costa *formosa*,
 var. *aurantiaca*, Towns.
 Femora wholly black; wings tawny and milky-radiate, the tawny blotch-like *formosa*,
 var. *hirtipes*, Fabr.

Females.

1. Wings black only on costal third, the rest abruptly clear; abdomen black, with two large basal spots yellow *phasiana*, sp. n.
 Wings abruptly limpid only on narrow internal border 2.
 2. Wings wholly black except inner border, without yellow colouring 3.
 Wings with more or less yellow, at least distinctly yellowish near costa 9.
 3. Body wholly black in ground-colour. 4.
 Not black species 6.
 4. Tegulae rich yellow, alulets half white and half black *tegulata*, Towns.
 Tegulae and alulets not so coloured 5.
 5. Hind femora not ciliate, legs and palpi black: smaller form *lanipes*, Fabr.
 Typical form.
 Hind femora subciliate apically, palpi and bases of femora more or less yellowish: large form *lanipes*,
 var. *tropicalis*, var. n.
 6. Hind femora strongly ciliate on posterior half 7.
 Hind femora not at all ciliate. 8.
 7. Mesoscutum with postsutural golden-pollinose markings; abdomen red, with black tip *formosa*,
 var. *radiata*, Lw.
 Mesoscutum without postsutural golden; abdomen red, with darker median line *formosa*, Wd.
 Typical form.
 8. Palpi and bases of femora black or brown; abdomen usually distinctly black on apical portion *formosa*,
 var. *hirtipes*, Fabr.
 Palpi and bases of femora reddish yellow; abdomen more or less dilute blackish or brown on tip *pennipes*,
 var. *pilipes*, Fabr.
 9. Wings yellow on whole costal border, the yellow bordered internally with faint or dilute fuscous gradually giving way to limpid; hind femora ciliate apically *subalipes*, Towns.
 Wings with a yellow patch near costa, sometimes subobsolete, but distinctly traceable; hind femora not ciliate *pennipes*, Fabr.
 Typical form.

36. *Trichopoda formosa*, var. *radiata*, Lw.

Two males, San Rafael, July 2 and 4. On flowers of the *Cordia* sp.

Length 15 to 17 millim.

This is the largest known form of *Trichopoda*, the var. *radiata* being even more robust than the typical *formosa*. The larger one of these specimens is especially robust, with the wing coloration pronounced and the tibial cilia strongly developed. Not only are the hind tibiæ ciliate in these forms, but the cilia encroach very largely on the hind femora, the upper and lower edges of the distal third to half being ciliate, as Wiedemann has described. These apical cilia of the hind femora are more or less developed in other of the larger species of *Trichopoda*, but in none so strongly as in the present form *radiata*. The wings are rather conspicuously yellow in these specimens, in a broad elongate subcostal patch extending from near base to a point halfway between tips of first and second veins. But the milky colour is still more conspicuous, radiating from the base of the wing over the yellow and fuscous alike. The abdomen is obscure brownish red with a purplish tinge, the apical segment reddish yellow, which represents more nearly the colour of the abdomen in life. The palpi and bases of femora are reddish yellow.

T. radiata is doubtless to be considered conspecific with *formosa*. It must be preserved as a good variety on its general greater robustness, and the presence of the golden-pollinose markings of mesoscutum behind transverse suture, which are apparently lacking in the typical *formosa*, a character which Loew failed to point out as differential. The somewhat lighter palpi and bases of femora, and more purplish abdomen of male, can hardly be used to distinguish it. Specimens of *Trichopoda* vary to a considerable degree. Wiedemann's specimens of *formosa* are described as having the thoracic lines white, the outer ones a little golden. In the species with conspicuous tibial cilia, these lines are normally deep golden yellow. But I have seen them wholly white, and even faint. I do not consider the colour of these lines of any importance. It is not a sexual, and it cannot be considered even a varietal character. In the smaller one of the present specimens, the deep golden pollen of mesoscutum behind the suture is highly developed, consisting of a pre-scutellar transversely-elongate subquadrangular area, with lateral edges continued forward in a narrow line on each side to suture, while posteriorly it spreads over the basal half of

disk of scutellum, though separated from latter by the silvery hind margin of thorax. In the other specimen this postsutural golden pollen is so faint as to be apparent only in a golden shade next the silvery hind margin of thorax, with none on the scutellum. Loew mentioned the postsutural golden in his description of *radiata*, but failed to notice that, from Wiedemann's description, it is evidently lacking in *formosa* and therefore of use as a differential character.

Neither Loew nor Wiedemann mentioned the yellow of the wings, which doubtless varies much and may even be obsolete in some specimens. Wiedemann evidently means the first basal cell, when he says, "Mittel oder Speichenzelle" milky. This is the case, at least. The present specimens agree with Loew's description in the milky radiations. Wiedemann says that these radiations follow the *inner* border of the longitudinal veins, which is true with the exception that it is the outer border in the case of the last section of fourth vein. The second costal cell is wholly milky. The specimens of *radiata* mentioned by me in Proc. Ent. Soc. Washington (ii. pp. 138-139) were taken at Dixie Landing, Va., early in July, on flowers of sumach (*Rhus* sp.). The previous specimen from same locality, mentioned in same Proceedings (i. p. 255), taken August 19, was from flowers of tansy (*Tanacetum vulgare*, L.).

37. *Trichopoda formosa*, var. *inconstans*, Wd.

Three males, San Rafael, July 2, 3, and 6. On flowers of the *Cordia* sp.

Length 13 to 15 millim.

I would refer these specimens to *aurantiaca*, Towns. (Proc. Ent. Soc. Wash. ii. p. 140), which should be ranked as a variety of *formosa*, were it not for the conspicuous golden-yellow markings back of the suture, which are absent in *aurantiaca*. It would fit the description of *luteipennis*, were it not for the distinct broad area of black extending from base to tip of wing broadly bordering the yellow posteriorly, and the black colour of the legs. It may best be referred to *inconstans*, which also should be considered a variety of *formosa*.

The present specimens agree with the description of *inconstans* in all except the triangular blackish areas of second to fourth abdominal segments. These are hardly perceptible, but still there seems to be a trace of them. Such markings can be of little use in separating dried specimens, being variable and doubtless due to the coagulation of the juices of

the abdomen beneath the tergum. Therefore I feel quite safe in referring these specimens to *inconstans*, since the peculiar characters of the wings and thorax agree so well with the description. As a variety it differs from the typical *formosa* not only in the characters of *aurantiaca*, but further by the postsutural golden markings of the mesoscutum.

38. *Trichopoda lanipes*, var. *tropicalis*, var. n.

One female, San Rafael, June 28. On flowers of the *Cordia* sp.

Length $13\frac{1}{2}$ millim.

This is a large form of *lanipes*. Fabricius's and Wiedemann's specimens measured about 9 millim. I have seen specimens of the smaller form, here considered to be the typical *lanipes*, which were only a little larger than normal specimens of *pennipes*. The present specimen has the deep golden pollen of sides of front clear and pronounced, being pointed-triangular in shape, filling out the space between frontal vitta and eye-margins anteriorly, and continued indistinctly backward along orbits nearly as far as vertex. The lines of thorax are distinctly golden, though inclining to whitish. Abdomen has a uniform bluish cast, apparently from a very thin covering of silvery pollen over the black ground-colour, but is nevertheless shining. Femora are yellowish red at base. Palpi brownish yellow. Otherwise the specimen agrees perfectly with the descriptions of Fabricius and Wiedemann. It shows some short cilia on upper and lower edge of hind femora apically.

The characters belonging to this variety are, in the main, its greater size, combined with the lighter palpi and bases of femora, and the femoral cilia. It is doubtless a tropical variety of the smaller typical form, which was from Carolina. I have seen other large specimens, from Mexico and South America, apparently belonging to this variety.

T. plumipes, Fabr., is doubtless to be considered another variety of *lanipes*, differing principally in the rust-colouring of scutellum and femora. It is small like the typical *lanipes*.

T. lanipes, presumably the typical form, has been recorded by Giglio-Tos (Ditt. Mess. iii. p. 6) from Cuautla (wrongly spelled with an *n*), which is in the State of Morelos. The specimen was collected by Saussure. In the same place, Giglio-Tos gives New Mexico as a locality for *lanipes*, referring to my paper, in which I gave no locality whatever, but merely remarked on the affinities of the species. He has similarly recorded *pennipes* from New Mexico, referring

to me as authority, while in my paper I stated that it was found "over the eastern half or more of the United States and in Mexico." He has still further, in the same manner, given New Mexico as a locality for *Ocyptera dosiades*. The paper of mine referred to ("Notes on North-American Tachinidæ, I.," Proc. Ent. Soc. Wash. ii. pp. 134-146) was published while I was in Washington, and all of my specimens therein mentioned, unless otherwise stated, were taken in the District of Columbia. These errors of locality should not be perpetuated, as they are very misleading with regard to the geographical range of species. No specimen of *Trichopoda* has ever been known, by any chance wind or shift of fortune, to occur in New Mexico! Neither does the genus *Ocyptera* occur there to my knowledge.

N.B.—It should be pointed out that in Bellardi, Sagg. Ditt. Mess., and Osten Sacken, Biol. C.-A., Dipt., the locality Cuautla is wrongly spelled, the mistake being doubtless due to the printers and proof-readers. The mistake has even become incorporated into dipterological nomenclature, in the name *Dasypogon cuantlensis*, Bell. (Ditt. Mess. ii. p. 67). The specific name should be amended to *cuautlensis*. Cuautla is pronounced *Kwah-oot'-lah*.

39-40. *Trichopoda pennipes*.

Typical form and var. *pilipes*, Fabr.

I refer here twenty-four specimens, sixteen males and eight females, all San Rafael, March 9 to July 18. All except the March 9 specimen (male), and one June 18 (male), were taken on flowers of the *Cordia*, sp., from June 30 to July 18.

Length of males $6\frac{1}{2}$ to 11 millim., of females 7 to 10 millim.

Notwithstanding the great variation in size, as well as considerable in wing-coloration, I must locate all of these specimens in this species. The form without yellow on the wings may be continued for the present as a variety under the name *pilipes*, Fabr., the description of which applies well. This is apparently the form which recent writers (Roeder, Wulp, and Giglio-Tos) have referred to under the name *pyrrhogaster*, Wd., which I consider a synonym of *pilipes*, Fabr. The proper separation of *pennipes* and *pilipes* can be known only by the capture *in coitú* of numerous specimens of both forms.

Nearly all of the present specimens have at least a tinge of brown on the tip of the abdomen, but this cannot be said to be general in either sex. The colour of the scutellum

varies from reddish yellow to black. It is black in nearly all of the females, while in most of the males it is lighter. The females are all quite constant in being without the postsutural golden markings of mesoscutum, or with only a trace of them. These markings consist in these forms of three golden lines joined posteriorly by a transverse line. They are constant and well defined in all of the males. The males vary in wing-colouring from specimens having a large yellow patch extending along costal margin from base of wing two-thirds way to tip, to others in which the yellow is subobsolete or entirely wanting; while the females, though usually without any yellow, in several cases show a trace of it on the wings. The femora in all the specimens are more or less broadly yellowish at base. Palpi reddish yellow. The orbital margins in all the females are silvery pollinose, in the males golden pollinose. The claws of both sexes, especially the female, vary in length, but they are usually comparatively longer in the male. The female abdomen is usually narrowed at tip. The abdomen of all the males is distinctly truncate apically, usually more or less flattened, and rarely subcylindrical. But in this connexion the male taken June 18 deserves special mention. It has the elongate tapering subcylindric abdomen of the female, is entirely without yellow on the wings, and has the postsutural golden markings less distinct; but it has the claws characteristic of the male, and possesses the male hypopygium. This difference in shape of the abdomen may be abnormal in this specimen. Another male, with well-marked yellow on the wings, approaches it somewhat in this respect.

Typical var. *pennipes*, Fabr.—The specimens of the above which I refer here are as follows: Thirteen males, one each, March 9, June 30, July 1, 2, 3, and 17; two each, July 4 and 5; and three, July 6. Two females, July 4 and 18. Length $6\frac{1}{2}$ to 10 millim.

Characterized by having a more or less distinct patch of yellow on wings in both sexes, less distinct in the female. Scutellum generally lighter in coloration. Wings appearing less pronouncedly black. Abdomen rust-yellowish.

Var. *pilipes*, Fabr.—The specimens which I would refer here are: Three males, June 18 (the ones specially mentioned above), July 4 and 10; six females, all July 3, except one July 2.

Length 7 to 11 millim.

Characterized by having no yellow on wings in either sex, or hardly a trace in the male. Scutellum generally shining

black. Wings pronouncedly black, except narrow limpid hind margin. The abdomen is generally, especially in the female, more distinctly orange-coloured.

This somewhat arbitrary separation of these two forms must be borne with till actual field observations prove their true relationships.

Both *pennipes* and *pilipes* were described by Fabricius and Wiedemann from the male, and the descriptions both apply well in regard to the postsutural golden markings of mesonotum. As before stated, these markings are quite constantly characteristic of the male in both varieties. *Phasia jugatoria*, Say, *Ocyptera ciliata*, Fabr., *T. pyrrogaster*, Wied., and *T. haitensis*, Desv., therefore all become synonyms of *T. pilipes*, Fabr., since all are dark-winged forms. Although Wiedemann designated the female in his description of *T. pilipes*, it is quite certain, from his diagnosis, that he was describing the male. The others seem all to have been described from the female (not including *pennipes*).

T. flavicornis, Desv., is another variety of *pennipes*, chiefly distinguished by its yellowish antennæ.

41. *Trichopoda histrio*, var. *indivisa*, var. n.

One male. San Rafael, June 30. On flowers of the *Cordia* sp.

Length 9 millim.

Fifth and sixth segments of abdomen thickly and densely deep golden-yellow pollinose. Fourth segment thinly so, showing a continuous golden surface only when viewed from in front parallel with the plane of the tergum. Second and third segments showing some silvery pollen when viewed in same way. No fasciæ, therefore, are shown on the abdomen, but a continuous pollinose surface, without interruption to the pollen on the median line. The fuscous of costal half of wing is very largely yellow, except at its base, tip, and on its posterior border, where it is more deeply smoky. Otherwise agrees well with Loew's description of *trifasciata*. It is thus seen that this form varies widely from the typical *histrio* in the pollen of abdomen, doubtless representing a Mexican or neotropical variety.

T. trifasciata, Loew, may be continued as a variety of *histrio*. Walker's specimen, which must be taken as typical, possessed only two abdominal fasciæ. It will be well to designate the form with three and four fasciæ by Loew's name.

The forms of *histrio* are entirely destitute of cilia on the hind femora.

I suspect that *T. umbra*, Walker, from Venezuela (List, p. 698), is another variety of *histrion*. It seems very probable from the description of the brown bloom on abdomen, becoming tawny on last segment, with a median vitta separating it. The specimen described was a female.

PENNAPODA, subgen. n.

Differs from normal forms of *Trichopoda* in the abdomen being nearly the same shape in both sexes, subcylindrical, rounded at tip, narrowed a little at base, not flattened-subquadrate in male. Hind tibiæ much less strongly ciliate, with weak cilia on apical half; claws of female very short, those of male elongate but black. Wings hyaline on more than inner half. Apical cell closed in margin. Characters of the vibrissæ and frontal bristles same as in *Trichopoda*, but the bristles somewhat stouter. It has a distinct facies.

Type *T. phasiana*, sp. n.

The forms of *Trich. histrion* connect this subgenus with *Trichopoda* proper. They are intermediate between the two, very much approaching *Pennapoda* in certain characters, but yet more nearly related to *Trichopoda* in general facies.

42. *Trichopoda phasiana*, sp. n.'

Ten males and six females. San Rafael, both sexes taken from June 30 to July 13. All on flowers of the *Cordia* sp.

Length of male 7 to 8 millim., of female 6 to 7 millim.

Male.—Face silvery, with a golden shade; orbits narrow, distinctly golden, extending nearly to vertex. Rest of front taken up with the very wide soft black frontal vitta. Antennæ blackish or brown, second joint below and base of third more or less yellowish, third joint not twice as long as second. Palpi yellowish. Mesonotum golden-pollinose, with three wide black vittæ, interrupted at suture, and more or less joined behind suture, sometimes in one transverse piece of black irregularly and widely bordered behind by golden. Sometimes the middle black vitta in front of suture is split from behind by a line of golden. Scutellum black, silvery pollinose except at base. Pleuræ silvery pollinose. Abdomen black, with a large oval pale yellow spot on second and third segments on each side, extending from near anterior margin of second to within about same distance (one fourth to one sixth length of segment) from posterior margin of third, notched on inner side, more or less obliquely extended posteriorly, the median black between the two spots being much wider on third segment than on second. Fourth and

fifth segments showing more or less distinctly a slight silvery pollen, rest of abdomen less distinctly so. Black of abdomen more or less shining through the pollen. Legs black, proximal third or fourth of hind femora yellow; coxæ and trochanters reddish yellow, with the dense silvery pollen of pleuræ extending over them. Hind tibiæ short ciliate on apical half. Pulvilli and claws elongate, latter wholly blackish, often with tips fractured and missing, as mentioned in *Trichopoda*, pulvilli whitish or yellowish fuscous. Wings evenly black along whole costa to tip for about one half of their width, the black filling out all three basal cells, but with apical cell clear or a little clouded across tip. Rest of wings nearly clear, subhyaline, sometimes faintly tinged with dilute smoky. Tegulæ very large, white, sometimes watery whitish; alulets small, about one sixth to one eighth size of tegulæ, white, sharply contrasted in colour with rest of wing.

Female.—Differs in face and orbits being entirely silvery white, not golden. Abdomen slightly less broad; abdominal spots more narrowed oblique, not so extensive on dorsum of third segment, not notched on inside, thus leaving the median black evenly and rapidly widened posteriorly from its least width at or behind middle of second segment; fourth and fifth segments more distinctly silvery pollinose, rather conspicuously so in comparison with the males. One male, however, has the abdominal markings and pollen almost as in the female. Claws and pulvilli very short. Sixth abdominal segment much less apparent.

Phania simillima, Fabr., Wied., apparently belongs to the subgenus *Pennapoda*, and is thus nearly allied to the present species. Its greater size (about 10 millim.), the reddish-brown instead of pale yellow abdominal spots, and the reddish-brown bases of femora and hind tibiæ preclude the identification with it of the present form.

43. *Cistogaster occidua*, Walk. (syn. *C. divisa*, Lw.).

One female. San Rafael, March 9.

Length 5 millim.

This specimen is perfectly normal, except that the pollen of mesonotum and front has a brassy tinge, and the silvery fascia is present on second segment of abdomen. Apical cell extremely short, petiolate.

In the first section of this paper I recorded a male specimen of *C. immaculata*, Macq. (No. 16). I must again, for the last time, correct my statement on the synonymy of these species. The remarks there should read as follows:—The

species possessing the normal female will be known as *C. occidua*, Walker. Loew's name *divisa* will remain a synonym of the latter. It is to be borne in mind that the form with the aberrant (dimorphic or male-like) female was described in the male by Macquart. The form with the normal female was described in the female by Walker, and later in the male by Loew. Therefore it is clear enough that Walker's name must stand.

As this subject has become somewhat complicated, I introduce the following table of males and females of *Cistogaster* known to me, which will remove all doubt and possible misunderstanding with regard to the separation of these species.

Table of *Cistogaster*.

Females.

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|--|----|---------------------------|
| 1. Mesonotum and scutellum shining black, without pollinose vittæ, only the humeri pollinose; sides of front shining black, hardly at all silvery; abdomen without distinct pollinose vitta or cross-bands, apical cell longer petiolate | 2. | |
| Mesonotum with three pollinose vittæ, scutellum pollinose; sides of front conspicuously silvery, well defined; abdomen black, with a median vitta and two or three fasciæ pollinose; apical cell shorter petiolate or closed in margin | | <i>occidua</i> , Walk. |
| 2. Abdomen distinctly red on sides, especially anteriorly; third and fourth segments with pollinose reflections on each side | | <i>immaculata</i> , Macq. |
| Abdomen wholly deep shining black, with or without pollinose reflections on apical segment . | | <i>Pallasii</i> , Towns. |

Males.

- | | |
|--|---------------------------|
| A longitudinal fuscous stripe on abdomen in connexion with the median pollinose vitta; abdomen bright ferruginous, third and fourth segments more or less pollinose | <i>occidua</i> , Walk. |
| Fuscous stripe of abdomen wanting, the median pollinose vitta more or less distinct; abdomen more yellowish, the third and fourth segments with pollinose reflections on each side | <i>immaculata</i> , Macq. |

Williston's *C. insularis*, female, from St. Vincent, is apparently a specimen of *C. occidua*, Walk. (as restricted in the table), with the median vitta obsolete on second segment. His *insularis*, male, is probably *immaculata*, Macq.

C. melanosoma, Wulp, is, so far as can be said from a two-line description, the same as *Pallasii*, the apical segment being distinctly pollinose instead of obsoletely so.

C. subpetiolata, Wulp, is a typical but small female of *occidua*, excepting only that the pollinose vitta and fascia of

second segment are obsolete, as in Williston's specimen from St. Vincent. No reliance can be placed on the character of the apical cell being petiolate, nor can the extent of the pollen on the abdomen be relied upon. These forms might be considered varieties, though it would be hard in that case to decide where to stop defining varieties and recognize mere individual variations.

C. propinqua, Wulp, if a female as designated, is at least a good variety, bearing the same relation to *occidua* that exists between *immaculata* and *Pallasii*. But the colour of the antennæ and palpi is of comparatively no importance.

C. griseonigra, Wulp, is probably a variety of *Pallasii*. But it is useless to speculate on descriptions not exceeding two to four lines, except in so much as they indicate what is still to be found and described. I will not attempt an examination of Wulp's male *Cistogasters*, which all seem easily referable to either *occidua* or *immaculata*, though, of course, nothing can be said of them in their present incompletely characterized state. It is greatly to be regretted that such a long delay, though doubtless unavoidable, in the appearance of the parts of the 'Biologia Centrali-Americana' should have caused the publication separately of such short diagnoses of species. The diagnoses, if presented separately in advance, should be full and complete.

It may be noted here that *Cistogaster* is another of those tachinid genera which are not at present known to occur in New Mexico.

Phaniidæ.

44. *Xanthomelanodes arcuata*, Say.

Four males and four females. Paso de Telaya, one female, March 28, and two females, April 7. San Rafael, one female, June 20, in sweepings. The males, all San Rafael, on flowers of the *Cordia* sp., June 29 and July 5, 12, and 16.

Length of males 5 to 7 millim., of females 5 to 6½ millim.

The allied *X. atripennis* was described by me in Notes N. Amer. Tachin. i. pp. 145-146, as a *Wahlbergia*. The latter genus should be known as *Besseria*. The present forms are very distinct from *Besseria*, lacking entirely the peculiar female abdominal characters of that genus, besides differing widely in other respects.

The present specimens of *arcuata* vary considerably in size, two of the males (July 5 and 16) and two of the females (March 28 and June 20) measuring only 5 millim.; but they hardly differ in coloration, and are without doubt all the same

species. They differ from my description of *atripennis* as follows:—

Whole face and sides of front of female silvery-white pollinose. The frontal stripe is sometimes but little widened anteriorly at base of antennæ. Mesonotum of male in front of suture deeply golden-yellow pollinose, with two median vittæ and a more or less elongate spot near suture velvet-black, the vittæ more or less united, except at posterior ends. In one of the smaller males the markings of mesonotum appear silvery with a golden shade. The elongate lateral spots are about half as long as the vittæ, or little more, and represent another pair of vittæ anteriorly obsolete. These black markings may be so approximated as to give the appearance of a golden fascia along the suture, with its anterior border irregular or jagged, as given in my description of *atripennis*; though this is not the case in the present specimens, and probably not in this species. The golden of hind border of mesoscutum is more or less extensive, and may be rather silvery. In the female the vittæ and golden pollen of mesonotum are very faint, except that the humeri are distinctly and rather broadly golden, following inward along front border of suture a short distance. The rest of thoracic dorsum appears more or less shining black, thinly shaded with silvery, the vittæ sometimes being faintly outlined. Scutellum is more or less faintly silvery. The males agree fairly well in colour of abdomen with description of *atripennis*. In the female the black of abdomen is much more extensive, leaving only a large more or less irregularly defined oblong lateral yellow spot on second and third segments. The black covers third segment in a large triangle, and on second segment appears as a narrow but sometimes much widened median vitta. In the female only the basal half or third, or even less, of hind femora is yellow; in male sometimes only basal half; other femora often only narrowly yellow on bases. (See my paper, above referred to, p. 143, for the colorational and abdominal differences in the sexes of *arcuata*, drawn from Illinois specimens.) The variation in colour of bases of femora just mentioned cannot be depended on as a specific character. Claws and pulvilli of female short. The antennæ vary a little in length, from slightly more to considerably more than one-half length of face. The sides of abdominal segments in female are conspicuously silvery pollinose in oblique lights. The frontal bristles are moderately strong, stronger than in Giglio-Tos's figure of *X. articulata*. Wings quite abruptly hyaline on somewhat more than inner half. Abdomen of male yellow, with basal segment more or

less completely black, second and third segments with a median black line always interrupted at sutures and often very indistinct, fourth segment with a black triangle, fifth wholly blackish. The specimens agree very well with Say's description, which, however, is very brief.

X. atripennis is closely allied to this species, differing only in the wings being almost wholly black, and the abdomen of male (female unknown) almost wholly yellow, the rust-brownish markings often subobsolete. Say's specimen of *Phasia atripennis* must have been a male, in which the presutural golden of mesonotum was not so much developed as in the present specimens, and with the median row of blackish spots obsolete. This species is known from Indiana, District of Columbia (*Towns.*), and Florida. My specimens from the District of Columbia were taken on the flowers of *Aster* sp.

X. arcuata is now for the first time recorded from Mexico. It is known elsewhere only from Indiana and Illinois.

Both of these species are quite different from *X. articulata*, Wulp and Giglio-Tos, to judge from the latter's figure and description, the antennæ being much elongate in *articulata*, and the abdominal segments bearing a lateral marginal macrochaeta, which characters are not possessed by *arcuata* and *atripennis*.

Wulp's short descriptions (*Tijdschr. voor Ent.* xxxv. 1892, p. 188), supplemented by Giglio-Tos's description and figure (*Ditt. Mess.* pt. iii. pp. 4-5, pl. fig. 12), place the genus *Xanthomelana* with sufficient certainty. The name should, however, as I have pointed out (*Can. Ent.*, July 1893, p. 167) be changed to *Xanthomelanodes*, the other name being rightly precluded by its close similarity to *Xanthomelon* in Mollusca, even though the derivation be not identical. The petiole of apical cell, as I have mentioned in the description of *atripennis*, is rather long, and not short as described by Wulp in his generic diagnosis. I believe that the genus should be restricted to the forms similar to *arcuata* and *atripennis*, with their venation; with antennæ short, having second and third joints nearly equal in length; and with the front wide in both sexes. The two species *anceps* and *articulata*, included in the genus by Wulp, are disturbing elements in its proper characterization and should be excluded. Wulp says nothing of the genital characters, by which it is very easy to distinguish the sexes. The male abdomen is blunt and laterally compressed apically, and the hypopygium is easily seen on the underside near tip. The female abdomen is more pointed at tip, and the segments are narrowed and drawn in. This genus belongs in the Phaniidæ.

It seems probable that Wulp's *X. dorsalis*, and perhaps some of his other species, are either identical with or constitute but varieties of *atripennis* and *arcuata*.

Note.—On the underside, at extreme base of abdomen, in both sexes, apparently on first segment, there is to be distinguished, sometimes plainly, sometimes with much difficulty, a transverse swelling or prominence of the yellow integument clothed with some rather conspicuous black hairs. This has nothing whatever to do with the ventral peculiarities of the second segment of female in *Besseria*, which are very different. And while on this subject I may here confirm Mr. Coquillett's maintenance of his genus *Celatoria* as distinct from *Besseria*. The ventral process of the second segment of male in *Celatoria* is wholly different, as are all the other characters. This can at once be seen by comparing the figure of *Celatoria* in 'Insect Life,' ii. p. 234, with that of *Besseria* given by Brauer and Bergenstamm in the 'Muscaria Schizometopa,' i. figs. 288 (head and abdomen of female), and by Coquillett's notes on the characters in 'Psyche,' June 1895, p. 252. *Celatoria* does not belong in the Phaniidæ at all, but in some as yet undetermined and undescribed group of the Tachinidæ.

It may be pointed out that *Wahlbergia brevipennis*, Lw., from Nebraska, is not a *Xanthomelanodes*. Neither is it a *Besseria*. I have had figures drawn of the head and wing of this species, as well as of several other of Loew's unrecognized North-American Tachinidæ, made from the type specimens in the Cambridge Museum, which will be published later in a separate paper. But it may be mentioned here that *Hyalomyia triangulifera*, Lw., which is one of these species, is not a *Hyalomyia*, but is identical with *Hyalomyodes Weedii*, Towns., which thus becomes a synonym. The species will be known as *Hyalomyodes triangulifera*, Lw. (see 'Psyche,' April 1893, pp. 429-430). Loew's *Euthera tentatrix* I have taken in New Mexico, on the Jornada del Muerto, in July; it belongs somewhere in the body of the Tachinidæ, s. str. *Xysta didyma*, Lw., and *Himantostoma sugens*, Lw., also belong in the body of the Tachinidæ.

N.B.—I may be accused by some persons of taking up valuable space with useless data in giving the dates of specimens, male and female, separately and in such detail as appears in this paper; but I believe that such data, when exact, taken in connexion with the prevailing meteorological conditions, may indicate much with regard to the life-histories of such insects, concerning which so little is at

present known. This is particularly the case when collecting is done every day for a considerable length of time, and done closely. From June 18 to July 20 I collected daily all the Diptera possible, especial attention being given to the *Cordia* flowers. It has been thought that, in the tropics especially, dates are of little or no consequence; but I observed at San Rafael, during my close collecting daily from early spring to midsummer, that as the season advanced very many species of insects appeared suddenly, where before there had been none at all to be found. This shows that species have their seasons in the tropics as well as in colder latitudes, a fact which is evident enough to anyone who has collected carefully for any length of time in tropical regions.

Hippoboscidæ.

LIPOPTENA.

Since the time when, in 1823, more than seventy years ago, Say described *Lipoptena depressa* taken from *Cariacus virginianus* in Pennsylvania, no mention has, to my knowledge, been made of further specimens of this genus from America. It will therefore be interesting to know that I secured between one and two hundred specimens from a Mexican white-tailed deer near Paso de Telaya.

45. *Lipoptena depressa*, var. *mexicana*, var. n.

Numerous specimens of both sexes, 153 in all, together with puparia, taken from ventral region, hind quarters, and sides of a white-tailed deer, *Cariacus virginianus*, var. *mexicanus*, March 27. Paso de Telaya.

The specimens agree fairly well with Say's description of *depressa*. The antennæ are yellowish. I can distinguish no brown lines on hypostoma, unless Say and Wiedemann refer to the two halves of the labrum which might have been appressed to the under surface in their specimens, or to the two linear spots above on each side of base of labrum. There are often, doubtless normally, three soft brownish longitudinally-elongate spots on posterior portion of tergum, the middle one the largest and heaviest, and situated a little farther posteriorly than the lateral ones. The middle one is often heightened, and the lateral ones obscured, by the developing larval case or puparium within the abdomen of the female, thus giving the appearance of a single heavy dark spot. All the specimens are wingless, but the wings are represented by well-developed rudiments. The lateral pointed elytra-like

raised portions of the tergum are shaded with soft brown, only the bases and tips being yellowish. My specimens remained in alcohol for nearly a year, so that I cannot give a more detailed colour description. From memory, however, I can say that the soft brown and yellow colours blended so as to give a very pretty effect, and I could hardly describe the insect as generally pale testaceous or yellow. Both Say and Wiedemann, in their descriptions, convey the idea that the tergum of abdomen is unicolorous, whereas in the present form the colour is well contrasted between soft brown and yellow in life, changing to brown and pale yellowish in alcoholic specimens. There is also, as I remember, a creamy bloom on the yellow portions in life, which heightens the colour effect. The legs are yellowish. The thorax has the darker lateral and posterior margins. The specimens vary in length from 2 to 4 millim., the usual size being 3 to $3\frac{1}{2}$ millim. Allowing for brevity in Say's description, and also for the possibly poor condition of his material, it is nevertheless my opinion that these Mexican specimens form at least a good variety of *depressa*.

Twenty-six of the females contain each a black puparium within the abdomen, well formed and nearly ready to escape. Others show it less advanced. Twenty-one of the specimens have a much narrowed form, the abdomen being the same width as thorax, and about the same size as latter. This form represents individuals that have recently emerged from the puparium. It may be noted that in these the lateral elytra-like pieces of tergum are not wrinkled or compressed to any extent; but the rest of tergum, which in the fully developed adult is spatulate and widened behind, is much wrinkled and compressed, indicating its recent escape from the puparium.

The puparium is 2 millim. long; $1\frac{1}{2}$ millim. wide at widest, which is across middle; and 1 millim. thick at thickest, in centre as seen from a lateral view. It is polished chestnut-brown, with a well-defined yellowish stripe around whole edge except at the cephalic end. The cap is shining blackish. Whole puparium is shining, rather short oval in dorsal outline, the cephalic end more tapering; slightly flattened or less convex on ventral surface, so as not to give a symmetrical profile view.

The abdomen of the male is rounded behind, rather entire in outline on posterior edge, hypopygium concealed, genital orifice removed a little from posterior edge of ventral surface. The abdomen of female is truncate behind, the posterior margin rather deeply emarginate on each side of genital

orifice, which is situated on or close to the posterior edge of ventral surface. Anyone desiring to intelligently comprehend the external anatomy of *Melophagus* and *Lipoptena* will do well to study carefully the excellent plate of *Melophagus ovinus* given by Dr. Cooper Curtice, in his work on the 'Animal Parasites of Sheep' (Bureau Animal Industry, U.S. Department of Agriculture, 1890, plate 4).

The male hypopygium in the present species can be clearly made out in a dry mount of the abdomen by the use of a high-power objective. The male organ itself is moderately stout and blunt at tip, rather than pointed as in Dr. Curtice's figures of *M. ovinus*.

Note.—Professor J. H. Comstock, in his new 'Manual for the Study of Insects,' p. 488, states that "the species of the genus *Lipoptera* (*sic*) are winged at first and live on birds; later they migrate to quadrupeds, where they remain, and having no further use for their wings, they lose them." I know not what authority Professor Comstock has for this statement, but I should feel that it was open to question. At all events it cannot be made as a general statement for the genus, for it is clear, from the preceding notes, that the present species breeds, certainly at times and presumably always, on deer; and, judging from the above specimens, which seem to show unmistakably their recent escape from the puparium, it is always wingless.

N.B.—In his recent revised 'Synopsis of North-American Diptera,' Dr. Williston has included *Trichobius*, in the table of Hippoboscidae, in the section with claws simple. It should be pointed out that *Trichobius* possesses bifid claws (see my description in Ent. News, 1891, pp. 105-106).

XXVII.—*Two new Species of the Genus Xanthospilopteryx, Wallengren.* By W. J. HOLLAND, LL.D., F.E.S., &c.

I HAVE recently received several examples of a fine species of *Xanthospilopteryx* from Cameroons which does not appear to be represented in European collections, and thus far has certainly not been described. I take pleasure in naming it after Mr. W. F. Kirby, the veteran student of entomological literature, whose recent monographic revision of the genus is of great value. While visiting the K.-k. Museum für Naturkunde at Berlin the other day Professor Karsch kindly pointed out to me a specimen of an allied species taken by Dr. Pogge in Equatorial Africa. Availing myself of the